CLAIMS

1.   An image processing apparatus characterized by comprising:

reduced image generation means for generating a reduced image
from an input image;

correction information acquisition means for acquiring
correction information of the input image based on the reduced image;
and

grayscale conversion means for converting grayscale of the
input image;

wherein the grayscale conversion means corrects contrast of
the input image using the correction information, as a processing
to be performed before and/or after the grayscale is converted.

2.   The image processing apparatus according to claim 1,
characterized by further comprising:

smoothing means for generating a smoothed image having
luminance L_c of pixels composing the input image smoothed based on
interpolation calculation using pixels composing the reduced image,

wherein the grayscale conversion means generate a
contrast-corrected image based on luminance L_c of pixels composing
the image, luminance L_1 of pixels composing the smoothed image, and
a predetermined gain value g.

3.   The image processing apparatus according to claim 1,
characterized by further comprising:

smoothing means for generating a smoothed image having
luminance L_c of pixels composing the input image smoothed based on
interpolation calculation using pixels composing the reduced image;
and

gain value setting means for setting a gain value g used for

correcting the contrast;

wherein the grayscale conversion means generate a contrast-corrected image based on luminance L_c of pixels composing the input image, luminance L_l of pixels composing the smoothed image, and a predetermined gain value g; and

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the gain value setting means can be configured so as to set the gain value g based on input initial gain value g_0, reference gain value 1, and an attenuation value $attn(Th_1, Th_2, L_c)$ calculated using a first luminance threshold value Th_1, a second luminance threshold value Th_2, and luminance L_c of pixels composing the input image.

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4. The image processing apparatus according to claim 1, characterized by further comprising:

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conversion means for generating a tone-converted image by converting luminance L of pixels composing the input image based on a conversion function;

smoothing means for generating a smoothed image by smoothing luminance L_c of pixels composing the tone-converted image; and

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gain value setting means for setting a gain value g used for correcting the contrast based on an initial gain value g_0 which expresses an inverse $1/\gamma$ of a slope γ of the conversion function;

wherein the contrast correction means generate a contrast-corrected image based on luminance L_c of pixels composing the tone-converted image, luminance L_l of pixels composing the smoothed image, and a gain value g; and

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the gain value setting means set the gain value g based on input initial gain value g_0, reference gain value 1, and an attenuation value $attn(Th_1, Th_2, L_c)$ calculated using a first luminance threshold value Th_1, a second luminance threshold value Th_2, and luminance L_c of pixels composing the tone-converted image.

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5.   The image processing apparatus according to claim 1, characterized in that:

the reduced image generation means generate a reduced image by converting the input image into the tone-converted image based on the conversion function and reducing a size of the tone-converted image;

the correction information acquisition means acquire correction information including a slope of the conversion function; and

the grayscale conversion means correct contrast of the tone-converted image based on the reduced image and the slope of the conversion function.

6.   An image processing method characterized by comprising:

a reduced image generation step for generating a reduced image from an input image;

a correction information acquisition step for acquiring a correction information of the input image based on the reduced image; and

a grayscale conversion step for converting grayscale of the input image;

wherein the grayscale conversion step corrects contrast of the input image using the correction information, as a processing to be performed before and/or after the grayscale is converted.